

**B. TECH.-VIEP-ELECTRICAL
ENGINEERING (BTELVI)
Term-End Examination
June, 2019**

BIEEE-018 : ADVANCED POWER ELECTRONICS

Time : 3 Hours

Maximum Marks : 70

Note : Attempt any five questions. All questions carry equal marks. Missing data, if any, may be suitably assumed. Use of scientific calculator is permitted.

1. (a) Draw and explain constructional features of a power BJT. 7
- (b) Discuss the operation of 3-phase fully controlled bridge converter feeding on R-L-E load. 7
2. (a) Explain the effect of blanking time on the output voltage of an inverter. 7
- (b) Describe turn-on and turn-off switching characteristic of IGBT. 7

3. (a) Describe the various methods used for the reduction of harmonics in the output voltage of voltage source inverters (VSI). 8
- (b) What are the differences between VSI and CSI ? Explain. 6
4. What are the various methods of power factor control ? Explain any *two* methods in detail. 14
5. (a) Draw the circuit diagram of 3-phase square wave inverter and explain its working with the help of necessary waveforms. 7
- (b) A 3-phase bridge inverter delivers power to resistive load from a 450 V d.c. source. For a star connected load of 10Ω /phase, find :
- $3\frac{1}{2}$ each
- (i) r.m.s. value of load current
- (ii) r.m.s. value of thyristor current for 180° conduction mode.
6. (a) Pertaining to inverters, define the parameters :
- (i) Harmonic factor of n th harmonic
- (ii) Total harmonic distortion (THD)
- Discuss how do these parameters help in evaluating the quality of inverters. 7

(b) A single-phase CSI is fitted with ideal SCRs. Describe its working for capacitive load. 7

7. Write short notes on any *two* of the following :

(i) GTO 7

(ii) IGBT 7

(iii) Three-phase SPWM inverter 7

(iv) Active power filtering 7